Amendments to The Specification:

Please insert the following paragraph as the first paragraph in the specification:

-- This application is a continuation of copending U.S. Patent Application S.N. 09/494,246, filed January 31, 2000, which is incorporated by reference herein in its entirety. --

On page 2, please replace the paragraph beginning on line 6 with the rewritten paragraph:

We have also discovered that for zero net dispersion there appears a preferred pulse duration for a particular map. The ratio $\cancel{\ddot{\beta}\, l/\tau - 4}$ $\underline{\ddot{\beta}\, l/\tau^2 \sim 4}$, where $\ddot{\beta}$ is the fibre dispersion, τ is the pulse duration and l is the fibre length. It means that the system (for the zero dispersion case) is specified by the pulse duration (effectively the data rate) and the dispersion of the fibres i.e. the length of each section can be immediately inferred. For example if $\tau = 20$ ps (10 Gb/s) and $\ddot{\beta} \sim 20\ \mathrm{ps}^2/\mathrm{km}$ (standard fibre), then the fibre lengths should be 80 km. Alternatively, if $\ddot{\beta} = 1\ \mathrm{ps}^2/\mathrm{km}$ (dispersion shifted fibre typical number) then 1600 km is ideal. Numerical modelling indicates that there are stable nonlinear transmission pulses for periodically dispersion managed systems where the path average dispersion may be either anomalous, zero, or even normal.

On page 2, please replace the paragraph beginning on line 24 with the rewritten paragraph:

According to a further aspect of the present invention there is provided a soliton or soliton-like pulse-based optical communication system comprising a length of optical

fibre divided into a plurality of sections wherein the average dispersion of the length of fibre is significantly different from the dispersion of each section and wherein the pulse duration τ is substantially equal to $\cancel{\frac{1}{4}\beta'' \ell}$ $\underline{\sqrt{\frac{1}{4}\beta'' \ell}}$ where β'' is the fibre dispersion, τ is the pulse duration and ℓ is the fibre length.

On page 6, please replace the paragraph beginning on line 5 with the rewritten paragraph:

In a two-stage map, where the dispersion alternates between normal and anomalous the pulse evolution is modelled by the nonlinear Schrödinger (NLS) equation

$$iu_z = \frac{\beta''}{2} u_{tt} + \gamma |u|^2 u$$

where z is the distance of propagation, t is the local time, β'' and γ are the dispersion and the nonlinear coefficient of the fibre, respectively. The pulse evolution in lossy fibres can also be modelled by this equation as long as the amplification period is different from the period of dispersion management. The stationary solutions in a two-stage map are characterized by three parameters, the map strength, $S = |\beta_1'' L_1 - \beta_2'' L_2| / \cancel{\tau_{FWHM}}\ \underline{\tau^2_{FWHM}}$ (subscript 1 and 2 refer to the normal and the ~~and the~~ anomalous dispersion fiber, respectively, L_n are the fibre lengths and τ_{FWHM} is the full width at half maximum at the mid-point of the anomalous fibre), the normalized average dispersion, $\beta'' = \beta''_{ave} / \beta''_2$ (β'' is the average dispersion) and the map asymmetry $\delta = (\gamma_1 / \beta''_1) / (\gamma_2 / \beta''_2)$. The map strength is the normalized length of the dispersion map, β'' is the average dispersion in fractions of the local dispersion of the anomalous fibre, the map asymmetry indicates how equal the fibres are with respect to nonlinear effects. For two fibres with equal

nonlinear coefficients ($\gamma_1 = \gamma_2$), δ is the ratio of the dispersions and around zero average dispersion this is just the ratio of the lengths, $\delta = L_1 / L_2$.